

[0072] FIGS. 8D and 8F show deployment of a UAV using a tilt mechanism 836 of the moveable UAV platform 820. As shown in FIG. 8D, the pod 822 may include a pod portion 836 that may tilt or otherwise move in response to activation of a tilt mechanism 838 to cause the UAV 108 to be directed to a particular launch direction. The tilt mechanism 838 may be a mechanical mechanism, pneumatic mechanism, and/or other type of mechanism that causes movement of the pod portion 836 relative to the traversal base 824 to cause the UAV 108 to launch in a direction away from the exterior shell 112 of the ML fulfillment center 800.

[0073] FIG. 8E shows the UAV 108 launching away from the pod portion 836. In some embodiments, a launch assist mechanism 840 may assist the launch of the UAV 108, such as by providing a force to move the UAV in an outward direction from the pod portion 836. The launch assist mechanism 840 may be mechanical mechanism, pneumatic mechanism, and/or other type of mechanism that causes movement of the UAV 108 relative to the pod portion 836 to cause the UAV 108 to launch in a direction away from the exterior shell 112 of the ML fulfillment center 800.

[0074] FIGS. 9 and 10 are flow diagrams illustrated as a collection of blocks in a logical flow graph, which represent a sequence of operations that can be implemented in hardware, software, or a combination thereof. The order in which the operations are described is not intended to be construed as a limitation, and any number of the described blocks can be combined in any order and/or in parallel to implement the process.

[0075] FIG. 9 is a flow diagram of illustrative operation 900 of a fulfillment center that uses UAVs to perform at least some deliveries of items from the fulfillment center. The process 900 is described with reference to the preceding FIGS. 1A-8E. Of course, the process 900 may be performed in other similar and/or different environments.

[0076] At 902, the UAV may be received at a ML fulfillment center. For example, the UAV may fly to a designated landing site of the ML fulfillment center, which may be located on one of multiple levels of the ML fulfillment center. The landing site may be external to the ML fulfillment center or may be within the ML fulfillment center.

[0077] At 904, the UAV may be readied for a next flight. For example, the UAV may be serviced, inspected, powered, undergo a battery replacement, coupled to a package for delivery, and/or otherwise interacted with prior to the next flight. In some embodiments, at least some of the operation 904 may be performed by one or more of the robots 124 in the ML fulfillment center. Human workers may perform some of the operations 904, such as maintenance operations, inspection operations, and/or picking of items for the package 110, among other possible tasks.

[0078] At 906, the package 110 may be coupled to the UAV 108. The coupling may be performed by a robot, by the UAV 108, and/or by a human worker. The package may be coupled to the UAV while the UAV is inside of the ML fulfillment center or while the UAV is outside of the ML fulfillment center and on a launch platform, for example.

[0079] At 908, the UAV may be deployed with the package for the destination associated with the package. In some embodiments, the UAV may be launched with a launch mechanism and/or with assistance by a launch assist mechanism, which may at least partially reduce an amount of energy used by the UAV to reach a cruising altitude. In some embodiments, the coupling of the package may be used to

impart a launch force on the UAV. The UAV may be launched at any angle outward from the ML fulfillment center, including in a direction perpendicular to the exterior shell 112 of the ML fulfillment center.

[0080] FIG. 10 is a flow diagram of additional illustrative operation 1000 of a fulfillment center that uses UAVs to perform at least some deliveries of items from the fulfillment center. The process 1000 is described with reference to the preceding FIGS. 1A-8E. Of course, the process 1000 may be performed in other similar and/or different environments.

[0081] At 1002, the UAV may be received at a ML fulfillment center at a first location. For example, the UAV may fly to a landing site of the ML fulfillment center, which may be located on one of multiple levels of the ML fulfillment center. The landing site may be external to the ML fulfillment center or may be within the ML fulfillment center.

[0082] At 1004, the UAV may be readied for a next flight. For example, the UAV may be serviced, inspected, powered, undergo a battery replacement, coupled to a package for delivery, and/or otherwise interacted with prior to the next flight. In some embodiments, at least some of the operation 1004 may be performed by one or more of the robots 124 in the ML fulfillment center. Human workers may perform some of the operations 1004, such as maintenance operations, inspection operations, and/or picking of items for the package 110, among other possible tasks.

[0083] At 1006, the package 110 may be coupled to the UAV 108. The coupling may be performed by a robot, by the UAV 108, and/or by a human worker. The package may be coupled to the UAV while the UAV is inside of the ML fulfillment center or while the UAV is outside of the ML fulfillment center and on a launch platform, for example.

[0084] At 1008, the UAV may be moved to a second location. For example, the UAV may be moved to a launch site of the ML fulfillment center, which may be located on one of multiple levels of the ML fulfillment center. The launch site may be external to the ML fulfillment center or may be within the ML fulfillment center. In some embodiments, the launch site may be on a different level of the ML fulfillment center than the landing site. In various embodiments, the UAV may be moved to a launch site that is higher than the landing site, thereby at least partially reducing an amount of energy used by the UAV to reach a cruising altitude. The UAV may be moved to the launch site by flight of the UAV, by one of the robots 124, by a human worker, and/or by other mechanisms (e.g., a conveyer, an elevator, a launch mechanism, a pneumatic tube, etc.).

[0085] At 1010, the UAV may be deployed with the package for the destination associated with the package. In some embodiments, the UAV may be launched with a launch mechanism and/or with assistance by a launch assist mechanism, which may at least partially reduce an amount of energy used by the UAV to reach a cruising altitude.

[0086] Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described. Rather, the specific features and acts are disclosed as illustrative forms of implementing the claims.

1. A multi-level fulfillment center configured to support distribution of items by unmanned aerial vehicles (UAVs), the multi-level fulfillment center comprising: